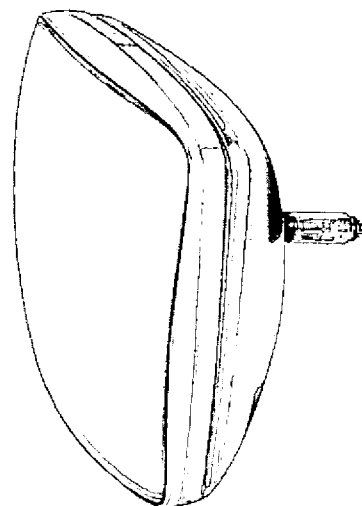


**RCA-19DQP4**  
**PAN-O-PLY**  
**PICTURE TUBE**

RCA-19DQP4 is a black-and-white pan-o-ply picture tube which eliminates the need for either an integral protective window or a separate safety-glass window and its companion dust seal in the receiver. Thereby internal reflections are reduced; consequently, picture contrast is improved. Integral implosion protection in the pan-o-ply picture tube is provided by means of a formed rim band and a welded tension band around the periphery of the tube panel. The 19DQP4 is a rectangular glass picture tube having an aluminized screen with nearly straight sides and slightly rounded corners.

Features of the 19DQP4 include:

- Pan-0-Ply—Integral Implosion Protection
- 114° Magnetic Deflection
- Low-Voltage Electrostatic Focus
- Aluminized Screen
- Electron Gun Requiring No Ion-Trap Magnet
- 11.625" Max. Overall Length
- 4.125" Neck Length
- 12.000" x 15.187" Screen
- 6.3 Volt/450 Ma Heater
- 23 kv Max. Anode Voltage



## GENERAL DATA

Electrical:

|                              |               |
|------------------------------|---------------|
| Focusing Method . . . . .    | Electrostatic |
| Deflection Method . . . . .  | Magnetic      |
| Deflection Angles (Approx.): |               |

|                       |      |
|-----------------------|------|
| Diagonal, . . . . .   | 114° |
| Horizontal, . . . . . | 102° |
| Vertical, . . . . .   | 85°  |

## Direct Interelectrode Capacitances:

|                                              |           |    |
|----------------------------------------------|-----------|----|
| Cathode to all other electrodes . . . . .    | 5         | pf |
| Grid No. 1 to all other electrodes . . . . . | 6         | pf |
| External conductive coating                  | {         |    |
| to anode <sup>a</sup> . . . . .              |           |    |
|                                              | 1500 max. | pf |
|                                              | 1000 min. | pf |

|                                     |          |         |
|-------------------------------------|----------|---------|
| Heater Current at 6.3 volts . . .   | 450 ± 20 | ma      |
| Heater Warm-Up Time (Average) . . . | 11       | seconds |

Heater warm-up time is defined as the time required in the test circuit shown in Fig. 1 for the voltage (E) across the heater terminals to increase from zero to 0.8 of rated heater voltage.

Electron Gun. . . . Type Requiring No Ion-Trap Magnet

**Optical:**

|                                                 |                             |
|-------------------------------------------------|-----------------------------|
| Phosphor. . . . .                               | P4—Sulfide Type, Aluminized |
| Faceplate . . . . .                             | Filterglass                 |
| Light Transmission at Center (Approx.). . . . . | 49%                         |

**Mechanical:**

Weight (Approx.). . . . . 15 lbs

Tube Dimensions:

|                           |                 |
|---------------------------|-----------------|
| Overall length. . . . .   | 11.375" ± .250" |
| Neck length . . . . .     | 4.125" ± .125"  |
| Diagonal. . . . .         | 18.732" ± .100" |
| Greatest width. . . . .   | 16.514" ± .100" |
| Greatest height . . . . . | 13.473" ± .100" |

Minimum Screen Dimensions (Projected):

|                           |             |
|---------------------------|-------------|
| Diagonal. . . . .         | 17.562"     |
| Greatest width. . . . .   | 15.187"     |
| Greatest height . . . . . | 12.000"     |
| Area. . . . .             | 172 sq. in. |

Bulb Designation. . . . . J149 F1

Cap Designation . . . . . Recessed Small Cavity  
(JEDEC No. J1-21)

Base Designation. . . . Small-Button Neoeightar 7-Pin,  
Arrangement 1. (JEDEC No. B7-208)

Basing Designation. . . . . 8HR

Pin 1: Heater

Pin 2: Grid No.1

Pin 3: Grid No.2

Pin 4: Grid No. 4

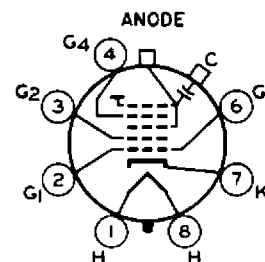
Pin 6: Grid No.1

Pin 7: Cathode

Pin 8: Heater

Cap: Anode (Grid No.3,  
Grid No.5, Screen,  
Collector)

C: External Conductive Coating



**BOTTOM VIEW**

Maximum and Minimum Ratings, Design-Maximum Values:<sup>b</sup>

Unless otherwise specified, voltage values are positive with respect to cathode

|                                                                   |                                                                        |       |
|-------------------------------------------------------------------|------------------------------------------------------------------------|-------|
| Anode Voltage . . . . .                                           | $\begin{cases} 23,000 \text{ max.} \\ 11,000 \text{ min.} \end{cases}$ | volts |
| Grid-No.4 Voltage:                                                |                                                                        |       |
| Positive value. . . . .                                           | 1100 max.                                                              | volts |
| Negative value. . . . .                                           | 550 max.                                                               | volts |
| Grid-No.2 Voltage . . . . .                                       | $\begin{cases} 550 \text{ max.} \\ 200 \text{ min.} \end{cases}$       | volts |
| Grid-No.1 Voltage:                                                |                                                                        |       |
| Negative peak value . . . . .                                     | 220 max.                                                               | volts |
| Negative bias value . . . . .                                     | 155 max.                                                               | volts |
| Positive bias value . . . . .                                     | 0 max.                                                                 | volts |
| Positive peak value . . . . .                                     | 2 max.                                                                 | volts |
| Heater Voltage <sup>c</sup> . . . . .                             | $\begin{cases} 6.9 \text{ max.} \\ 5.7 \text{ min.} \end{cases}$       | volts |
| Peak Heater-Cathode Voltage:                                      |                                                                        |       |
| Heater negative with respect to cathode:                          |                                                                        |       |
| During equipment warm-up period not exceeding 15 seconds. . . . . | 450 max.                                                               | volts |
| After equipment warm-up period. . . . .                           | 300 max.                                                               | volts |
| Heater positive with respect to cathode:                          |                                                                        |       |
| Combined AC & DC Voltage. . . . .                                 | 200 max.                                                               | volts |
| DC Component. . . . .                                             | 100 max.                                                               | volts |

Typical Operating Conditions for Cathode-Drive<sup>d</sup> Service:

Unless otherwise specified, voltage values are positive with respect to grid No.1

|                                                                               |          |         |
|-------------------------------------------------------------------------------|----------|---------|
| Anode Voltage . . . . .                                                       | 16,000   | volts   |
| Grid-No.4 Voltage <sup>e</sup> . . . . .                                      | 200      | volts   |
| Grid-No.2 Voltage . . . . .                                                   | 300      | volts   |
| Cathode Voltage for visual extinction of focused raster (See Fig.2). . . . .  | 28 to 62 | volts   |
| Field Strength of required adjustable Centering Magnet <sup>f</sup> . . . . . | 0 to 8   | gauss   |
| Maximum Circuit Value:                                                        |          |         |
| Grid-No.1 Circuit Resistance. . . . .                                         | 1.5 max. | megohms |

<sup>a</sup> Includes implosion-protection hardware.

<sup>b</sup> The maximum ratings in the tabulated data are established in accordance with the following definition of the Design-Maximum Rating System for rating electron tubes.

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron device of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.

The device manufacturer chooses these values to provide acceptable serviceability of the device, taking responsibility for the effects of changes in operating conditions due to variations in device characteristics.

The equipment manufacturer should design so that initially and throughout life no Design-Maximum value for the intended service is exceeded with a bogey

device under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, and environmental conditions.

<sup>c</sup> Measured between the heater terminals.

<sup>d</sup> Cathode drive is the operating condition in which the video signal varies the cathode potential with respect to grid No.1 and the other electrodes.

<sup>e</sup> The grid-No.4 voltage required for optimum focus of any individual tube will have a value anywhere between 0 and +400 volts with the combined grid-No.1 voltage and video-signal voltage adjusted to give an anode current of 200 microamperes on a 13-1/2-inch by 18-inch pattern from an RCA-2F21 monoscope, or equivalent.

<sup>f</sup> Distance from Reference Line for suitable PM centering magnet should not exceed 2-1/4 inches. The specified centering magnet compensates only for the effect which mechanical tube tolerances may have on the location of the undeflected, focused spot with respect to the center of the tube face. Maximum field strength of adjustable centering magnet equals

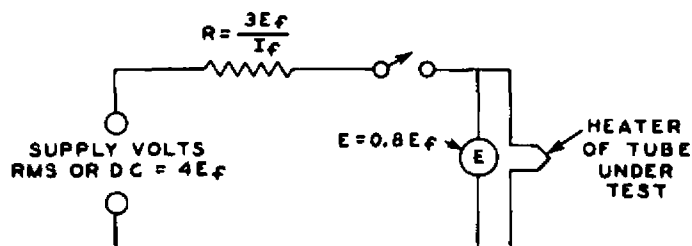
$$\sqrt{\frac{\text{Anode volts}}{16000 \text{ volts}}} \times 8 \text{ gauss}$$

The equipment manufacturer must determine and supply additional compensation for the effects of the earth's magnetic field and extraneous fields due to choice of circuitry and components. The additional compensation should preferably be applied as part of the magnetic field of the deflecting yoke.

## OPERATING CONSIDERATIONS

**X-Radiation Warning.** When operated at anode voltages up to 16 kilovolts, this picture tube does not produce any harmful X-radiation. However, because the rating of this type permits operation at voltages as high as 23 kilovolts (design-maximum value), shielding of the tube for X-radiation may be needed to protect against possible injury from prolonged exposure at close range whenever the operating conditions involve voltages in excess of 16 kilovolts.

## TEST CIRCUIT FOR DETERMINING HEATER WARM-UP TIME

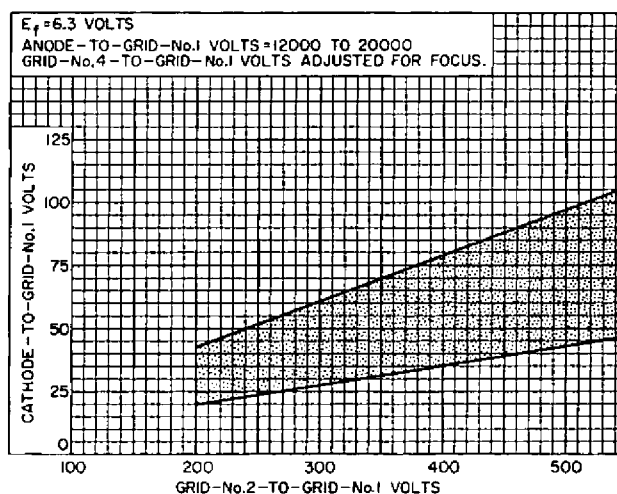


$E_f$  = RATED HEATER VOLTAGE OF TUBE UNDER TEST.  
 $I_f$  = RATED HEATER CURRENT OF TUBE UNDER TEST.  
 92CS-8503

Fig.1

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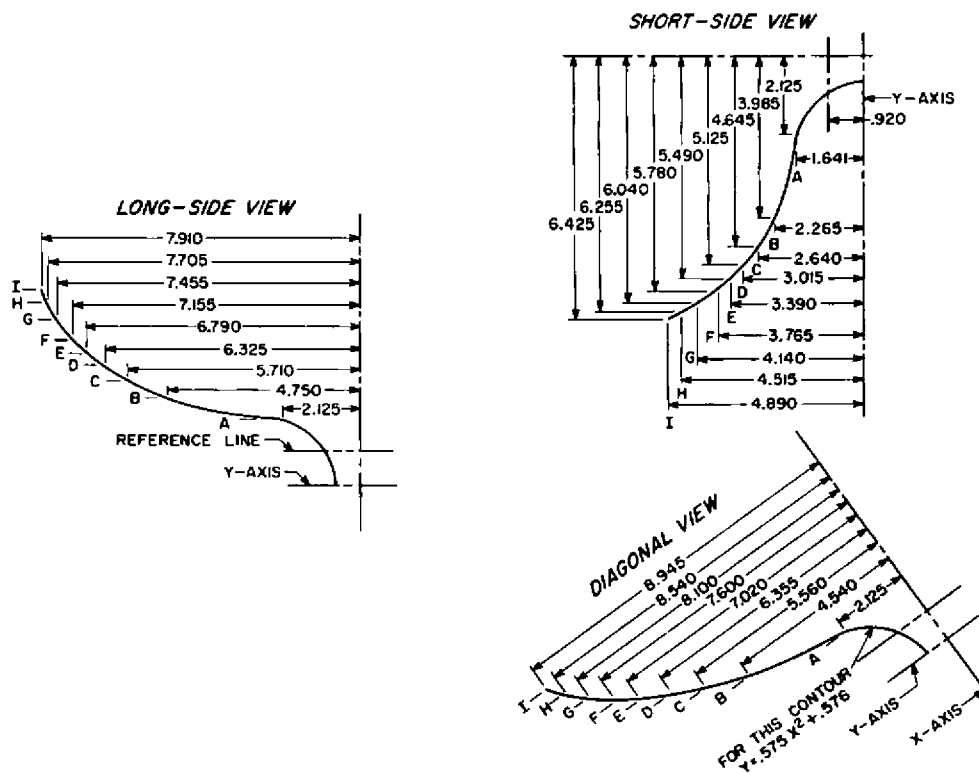
# **RASTER CUTOFF CHART** For Cathode-Drive Service



92CS-12008

Fig.2

## **BULB-CONTOUR DIMENSIONS**



DIMENSIONS IN INCHES

92CM-12294

PLANES A THROUGH G ARE NORMAL TO THE TUBE AXIS AND AT FIXED LOCATIONS FROM THE Y AXIS. THESE COORDINATES DESCRIBE THE BOGIE BULB EXTERNAL CONTOUR IN PLANES THROUGH THE TUBE AXIS AND THE RESPECTIVE FACEPLATE AXES.

